Standard Form
$Ax + By = C$

POINT-SLOPE FORMULA

NAME: _____

Block: _____

POINT-SLOPE FORMULA, $\mathbf{y - y_1 = m(x - x_1)}$

is used to find the equation of a line when **given** a point and the slope of a line.

1) Substitute the values for $\mathbf{y_1}$, $\mathbf{x_1}$, and **the slope** (m) into the formula.
2) The **"x"** and the **"y"** remain in the formula.
3) Solve for **y** to find the linear equation in the slope-intercept formula, $\mathbf{y = mx + b}$

Examples:

through: $(2, 1)$, slope $= \frac{3}{2}$ (x_1, y_1)

$\mathbf{y - y_1 = m(x - x_1)}$

$(y-1) = \frac{3}{2}(x-2)$

$2(y-1) = 3(x-2)$

$2y - 2 = 3x - 6$

$-3x \quad\quad -3x$

$-3x + 2y - 2 = -6$

$+2 \quad\quad +2$

$-3x + 2y = -4$

through: $(-5, -3)$, slope $= 1$ (x_1, y_1, m)

$\mathbf{y - y_1 = m(x - x_1)}$

$y + 3 = 1(x + 5)$

$y + 3 = x + 5$

$-x \quad\quad -x$

$-x + y + 3 = 5$

$-3 \quad\quad -3$

$-x + y = 2$

Practice:

through: $(2, -3)$, slope $= -\frac{5}{7}$

$\mathbf{y - y_1 = m(x - x_1)}$

$(y+3) = \frac{-5}{7}(x-2)$

$7(y+3) = -5(x-2)$

$7y + 21 = -5x + 10$

$+5x \quad\quad +5x$

$5x + 7y + 21 = 10$

$-21 \quad\quad -21$

$5x + 7y = -11$

through: $(3, -1)$, slope $= -\frac{2}{3}$

$\mathbf{y - y_1 = m(x - x_1)}$

$(y+1) = \frac{-2}{3}(x-3)$

$3(y+1) = -2(x-3)$

$3y + 3 = -2x + 6$

$+2x \quad\quad +2x$

$2x + 3y + 3 = 6$

$-3 \quad\quad -3$

$2x + 3y = 3$

What Do You Call Two Birds Relaxing In the Midday Sun?

Find the equation of the line through the given point with the given slope. Cross out the letters next to each correct answer. For each letter pair you DON'T cross out, write the uppercase letter in the box with the lowercase letter.

In Exercises 1-5, write your answer in point-slope form.

1. $(3, -4)$; $m = 2$

2. $(-1, 5)$; $m = -\frac{4}{3}$

3. $(8, 0)$; $m = \frac{7}{2}$

4. $(-2, -9)$; $m = -\frac{1}{6}$

5. $(0, -6)$; $m = -3$

Answers 1-5

o • D $y = \frac{7}{2}(x - 8)$

g • N $y + 2 = -\frac{1}{6}(x - 9)$ **f • R** $y + 4 = 2(x - 3)$

b • L $y + 6 = -3x$ **c • A** $y + 5 = -\frac{4}{3}(x + 1)$

j • E $y - 5 = -\frac{4}{3}(x + 1)$ **l • I** $y - 6 = 3x$

n • S $y = -\frac{7}{2}(x + 8)$ **d • T** $y + 9 = -\frac{1}{6}(x + 2)$

In Exercises 6-10, write your answer in slope-intercept form.

6. $(8, 5)$; $m = \frac{1}{4}$

7. $(4, -1)$; $m = -2$

8. $(-6, 2)$; $m = \frac{5}{3}$

9. $(-7, -4)$; $m = -\frac{1}{2}$

10. $\left(\frac{3}{2}, 0\right)$; $m = 5$

Answers 6-10

f • I $y = -\frac{1}{2}x - \frac{9}{2}$

i • F $y = \frac{5}{3}x + 12$ **k • T** $y = -2x + 7$

j • O $y = -2x + 3$ **m • N** $y = \frac{5}{3}x + 7$

e • R $y = 5x - \frac{15}{2}$ **b • B** $y = 5x - 12$

h • E $y = \frac{1}{4}x + 3$ **a • S** $y = -\frac{1}{2}x - \frac{15}{2}$

In Exercises 11-15, write your answer in standard form with integer coefficients.

11. $(-5, 2)$; $m = \frac{2}{5}$

12. $(-6, -1)$; $m = -4$

13. $(3, -3)$; $m = -\frac{3}{8}$

14. $\left(0, \frac{1}{2}\right)$; $m = \frac{9}{4}$

15. $\left(\frac{16}{3}, -9\right)$; $m = 0$

Answers 11-15

k • L $-2x + 5y = 20$

e • K $3x - 8y = 20$ **d • S** $-9x - 4y = -15$

o • E $4x + y = -25$ **h • G** $y = -9$

k • B $-2x - 5y = 15$ **i • R** $-4x + y = -9$

d • T $3x + 8y = -15$ **e • P** $-9x + 4y = 2$

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o